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ABSTRACT

3-year project was undertaken to investigate use of computer conferencing as a technique for enhancing personnel development activities. During year 2, the second objective of the study was addressed--to identify and develop technical and pedagogical topics that could be addressed with computer conferencing techniques. Three technical programs using computer conferencing were developed to meet selected needs of vocational teachers in the Central Region of Ohio. One technical program was developed and piloted in each of these areas: agriculture, trade and industry, and home economics. A pedagogical course was also offered for vocational and preservice vocational teachers. Project Symbiosis, the agriculture technical program, used Participate as the computer conferencing software to integrate the technology of communicating electronically with and among science and agriculture teachers. Little electronic interaction occurred due to teachers' inability to access the system. A trade and industry technical program in hazardous material was also conducted. A technical program in home economics focused on teaching thinking. Strengths of this conference/seminar were teacher development of basic computer skills and teacher enthusiasm for furthering their computer skills for electronic communication. Cost and time constraints were concerns. Participants in the pedagogical program in instructional design were frustrated by problems with the software. (YLB)

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EXAMINING COMPUTER CONFERENCING AS A TECHNIQUE FOR ENHANCING PERSONNEL DEVELOPMENT ACTIVITIES: FINAL REPORT FOR YEAR TWO OF A THREE YEAR INTERDISCIPLINARY STUDY

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The Central Region Vocational Education Personnel Development Center has been investigating the use of microcomputers as a technique of enhancing personnel development activities. Specifically, the use of computer conferencing was examined. The project was initiated in the summer of 1990 as a three-year interdisciplinary project involving the departments of Agricultural Education, Educational Studies, and Home Economics Education. The objectives of the project were:

1. To determine the availability of resources for conducting personnel development activities by computer conferencing in the Central Region of Ohio.

2. To identify and develop technical and pedagogical topics that could be addressed with computer conferencing techniques.

3. To determine the effectiveness and efficiency of computer conferencing in enhancing and supplementing personnel development activities.

Year one involved the collection of information regarding perceived ability to use and the attitudes toward using microcomputers held by vocational teachers in the Central Region in Ohio. The study also sought to identify microcomputer resources available to vocational teachers.

The population for the study was all vocational teacher in the Central Region of Ohio during the 1990-91 academic school year (N=1341). A random sample of 350 vocational teachers was taken from the population yielding a response rate of 244 (72%) teachers.

The finding indicated that teachers felt "somewhat" competent as indicated on a four point Likert-type, anchored scale from 1) "not at all", 2) "not very", 3) "somewhat", and 4) "very" competent in their ability to use microcomputers. Four major factors were identified that influenced vocational teachers' attitude toward microcomputers for in-service education. The factors were labeled as: (1) Educational Application of microcomputer, (2) personal Apprehensions toward using microcomputers, (3) personal Motivation for using microcomputers, and (4) Professional/Work Context. Approximately 57% of the variance in the attitude vocational teachers' held toward using microcomputers was accounted for by the four factors. It was also found that roughly half (48.1%) of the vocational teachers own a microcomputer and half (50.2%) have a microcomputer available to them at their respective school. In addition, approximately 27% of the vocational teachers reported to have access to a modem either at home or at school.

Also investigated was the perceived microcomputer competence of public school administrators in the Central Region of Ohio. The

population included all administrators in the Central Region of Ohio during the 1990-91 academic school year (N=176). A random sample of 137 was taken yielding a response rate of 107 (78.1%) administrators.

It was found that administrators perceived themselves to be "somewhat" competent in their ability to use microcomputers. In addition, four major factors were identified that influenced administrators' attitude toward microcomputers for in-service education. The four factors were labeled as: (1) Administrative Applications of microcomputers, (2) Instructional Benefits of microcomputers for in-service education, (3) personal Apprehensions toward using microcomputers, and (4) personal Motivation for using microcomputers. The four factors were found to account for 51.8% percent of the variance in administrators' attitude toward microcomputers for in-service education. The data also revealed that 55.1% of the administrators owned a microcomputer and 61.4% reported that their school provided them with their own computer. Fifty-seven percent (57%) of the administrators indicated that they had access to a modem either at home or at school.

During year two, the second objective of the study was addressed. Technical and pedagogical programs using computer conferencing were designed and pilot tested.

Three technical programs utilizing computer conferencing were developed to meet selected needs of vocational teachers in the Central Region of Ohio. One technical program was developed in each of the following areas: agriculture, trade and industry, and home economics. The technical program in home economics was not offered due to insufficient enrollment. Additionally, a pedagogical course utilizing computer conferencing was offered for vocational and preservice vocational teachers. Table 1 provides a summary of the pilot courses offered by department, course, and number of students.

Table 1

Pilot Courses Offered During the Winter and Spring Quarters of 1992 at The Ohio State University

Service Area	Course	Type[a]	No. of Students
Agriculture	Project Symbiosis	T	30
Trade and Industry	Hazardous Material	T	38
Home Economics	Teaching Thinking	T	0
Trade and Industry	Instructional Design	P	8

[a]Type of Program: T=Technical; P=Pedagogical

Summaries of the pilot test results of the technical and pedagogical programs are presented below. The pilot test of the technical courses included those in the service areas of agriculture, trade and industry, and home economics. The pilot test of the pedagogical course was conducted in the trade and industry service area. The report is concluded by a section on project conclusions and recommendations.

Pilot Test Results of the Technical Programs

Agriculture

Project Symbiosis was initiated by a research team at The Ohio State University during the fall of 1991. Project Symbiosis was designed to foster the teaming of science and agriculture teachers and to increase the science literacy of their students. Thirty teachers representing 15 secondary schools in Ohio participated. The teachers met during five all-day workshops in which the latest technology and applications of science principles to agriculture were presented.

Purpose and Objectives

The computer conference research team sought to integrate the technology of communicating electronically with and among teachers in Project Symbiosis using Participate as the computer conferencing software. The purpose of integrating computer conferencing was to increase communication between and among the teachers and project staff. It was believed that the communication technology would facilitate a continual involvement in the "teaming" project rather than the once a month single meetings typical of many personnel development efforts. The specific objectives were:

1. To introduce the electronic communication technology as a viable source for sharing and discussing information as well as provide a medium for presenting questions and concerns.

2. To increase communication between and among teachers and project staff.

3. To identify the strengths and problems or concern of computer conferencing when utilized by secondary teachers.

Procedures

In November, 1991 the computer conferencing team scheduled a workshop to introduce computer conferencing using the PARTICIPATE software to the Project Symbiosis teachers. Representatives from The Ohio State University Academic Computing Services (ACS) provided an overview of the electronic communication technology and instructions for its use. Teachers were also asked what kind of computer and communication equipment was available to them in their

home or school. A week later, the teachers were sent software and operating instructions, the system password, and a site license agreement form.

During the first workshop on computer conferencing, the teachers were introduced to computer conferencing. At the January 1992 Project Symbiosis in-service meeting, the computer conferencing team instructed the teachers in the use of the electronic communication system at OSU. This included logging on to the ACS main computer, accessing the computer conferencing system, and sending a message via PARTICIPATE.

Results

Little electronic interaction between and among teachers and the project staff occurred during the last three months of the project. Other than the January workshop, few teachers were able to access the system from their school or home. This resulted from a lack of hardware such as modems, insufficient training, and the absence of a strong incentive for use.

Strengths. Several strengths were identified in the integration of computer conferencing into Project Symbiosis. Among the strengths were: teachers were moderately knowledgeable in the use of computers; teachers exhibited a positive attitude toward using computer conferencing and were willing to participate in the medium; and teachers all had some sort of computer available to them at school or at home. In addition, the OSU Academic Computing Services staff supported and willfully cooperated with the research team in providing training, communication software, account numbers, and consultation in using the system; computer facilities were available for training; and cooperation from the Project Symbiosis team was provided.

Problems and Concerns. The computer conferencing staff provided continual support and encouragement for using the electronic communication system. However, the limiting element to using computer conferencing was the lack of time in providing a more thorough presentation and application of computer conferencing. As such, the computer conferencing research team was unable to provide teachers with necessary information to foster a better understanding electronic communication.

Another problem and concern was the lack of modems. While the majority of the teachers had modems available to them, others were limited in this respect. The computer conferencing team was able to provide those needing modems with such.

Problems in accessing dedicated telephone lines at school to connect with the campus computer was expressed by the teachers. Consequently, the teachers were unable to make outside calls or long distance call via the communication software.

Additionally, there was a lack of incentives to increase teachers' use computer conferencing. As such their was not a strong felt need by the teachers to use the electronic communication system.

Recommendations

Several recommendations are offered regarding the use of computer conferencing for communicating between and among teachers. The recommendations include:

1. Ensure the availability of the appropriate hardware (computers and modems), software (communications package), and procedures for using computer conferencing.

2. Inform participants about computer conferencing and allow ample practice to ensure that the participants become comfortable in using computer conferencing.

3. Participants should be strongly encouraged or required to access PARTICIPATE on a regular basis as part of the in-service program.

4. Ensure cooperation and support from the university computer system staff in developing a program using computer conferencing.

Trade and Industry

During the 1991-92 academic year the Vocational Education section of the Department of Educational Studies planned and conducted an in-service training activity for trade and industrial education teachers and administrators in the metropolitan Columbus area. The training activity focused on proper procedures for handling, storing, or disposal of toxic and hazardous waste materials. The activity took the form of a one-day workshop. Following the workshop the participants were expected to complete a plan for handling, storing, and disposing of hazardous materials that might be used in their specific vocational programs. Participants were urged to work on their plans utilizing computer conferencing. This would allow participants to work in small "on-line" groups with other teachers, building administrators, and workshop presenters.

Two workshop instructors provided the technical content instruction for the workshop. The two instructors were, David Bowman, Coordinator of the Hazardous Materials Bureau, and Willie Beaver, Chief of the Hazardous Materials Bureau from the Ohio Fire Academy, located in Columbus, Ohio. The instructors also agreed to serve as on-line consultants to interact with in-service participants who chose to develop their instructional plans utilizing computer conferencing.

Thirty-eight participants attended the workshop held on April 30, 1992. Of these participants, twenty-one signed-up for Continuing Education Units (CEU) or college credit. The individual participant's plan will be developed during June and July of 1992. The number of these participants that will choose to utilize computer conferencing in the development of their plan is unknown as of this date. It is estimated that approximately 40 percent will choose this option.

The objective of the workshop sought to have each participant develop a plan for accomplishing four goals. The goals were: 1) the identification of environmentally damaging and hazardous materials, 2) the safe storage of environmentally damaging and hazardous materials, 3) the safe disposal of hazardous wastes, and 4) the instruction of students.

The results of using computer conferencing as a medium for "on-line" dialogue for developing and completing plans for handling, storing, and disposing hazardous materials by workshop participants is forthcoming.

Home Economics

During the fall of 1991, a "Computer Conference about Teaching Thinking" was designed and advertised for offering during Spring Quarter, 1992. Eleven home economics graduate students/teachers enrolled in the home economics education course, "Computer Technologies in Home Economics Learning Environments."

Purpose and Objectives

The purpose and major objective of this program for vocational home economics teachers was to utilize computer conferencing for participating in a professional development seminar. Three objectives related to the teaching of thinking were set for the conference/seminar because thinking and reasoning skills are part of the conceptual framework for home economics curricula in Ohio. The objectives were:

1. Define characteristics and dimensions of thinking.
2. Assess ability to teach thinking.
3. Improve teaching skills and strategies to develop thinking skills in students.

Procedures

The conference/seminar design and content was developed and reflected input sought from the computer conferencing research team. Students piloted the use of e-mail as a conferencing

technology from on-campus locations and expressed overall satisfaction, but there were minor frustrations. Students were positive about the use of two content experts for conference, the assignments, and the selected reading materials, but felt that the conference/seminar could be too much if there were also frustrations with the conferencing technology.

An advertisement for the computer conference seminar in the fall issue of a statewide vocational home economics teachers newsletter requested interested home economics teachers to contact the instructor. The advertisement also stated that participants must have basic computer skill and access to a computer.

Results

During early 1992, twelve home economics teachers requested more information about the conference/seminar from the instructor. Though all of the teachers reported to be computer owners and frequent users, none of them owned a modem or ever used a computer for communication. None of the teachers had interest in using the conference/seminar credit toward a degree. Upon receipt of the preliminary seminar syllabus, none of the teachers would commit to participation during the Spring Quarter of 1992. Each teacher identified more than one reason for not participating in the spring conference/seminar. Primary reasons were unwillingness to purchase a modem at the time, other expenses related to the seminar, i.e. readings, and concern about the time involved in the seminar and the time for other involvements during the spring. Most of the teachers suggested that another time of the year such as winter or summer would be more preferable. Teachers also wished to be informed about future opportunities for computer conferencing.

Strengths. The twelve home economics teachers reported to have basic computer skills and an expressed enthusiasm in furthering their computer skills for electronic communication. Course content was perceived by potential participants to be valuable and appropriate for the technology.

Problems and Concerns. The primary concerns teachers expressed was related to the perceived time and cost for the conference/seminar. Teachers perceived that learning the electronic communication technology, combined with readings, would take more time that they were willing to commit. The problem of not having a modem was also a hinderance to teacher participation.

Recommendations

Based on the results of the pilot test, the following recommendations are offered:

1. Provide availability to the electronic communication technology and procedures without cost to participants.

2. Provide a seminar not related to content, but solely for learning the electronic communication technology.

3. Offer the course for first time participants during the summer or winter.

Pilot Test Results of the Pedagogical Program

The need to improve the quality of vocational teacher preparation is of critical importance to America's economy. This need will continue to increase as America's businesses and industries change to meet the challenges of a dynamic world market place. To meet these challenges, vocational teacher educators will need to design, develop, and deliver flexible instruction, that addresses the development of higher-order cognitive skills.

In order to maximize the vocational teacher's in-training learning, flexible technology-influenced instructional strategies must be utilized. Furthermore, these strategies must be orchestrated to stimulate the vocational teacher's overt participation.

Purpose and Objectives

The purpose of this project was to conduct a comparative analysis of daily journals, learner interactions, and exit interviews to identify and describe the problems encountered and successes experienced during this participatory research. The study examined the experiences of two undergraduate and six graduate students enrolled in a five quarter hour course during the Winter Quarter, 1992 at The Ohio State University whose purpose was to design a technology-influenced, distance education course on the preparation of instructional materials for vocational teachers. To facilitate communications between students and with the researcher, a computer conferencing software package entitled "PARTICIPATE" was utilized.

More specifically, this study attempted to answer these questions:

1. What successes did the learner experience during computer conferencing activities?

2. How were these successes measured?

3. What problems and frustrations did the learner encounter during computer conferencing activities?

4. How were these problems and frustrations handled?

5. How did the learners view the value of computer conferencing, and why?

Procedures

As a naturalistic inquirer, the researcher functioned as a data collection instrument during learner interactions. The researcher utilized responsive evaluations for learner interactions, and summative adoptive evaluations for computer conferencing activities to assure the use of subject matter being discussed.

The major findings represent a triangulation of data obtained through learner interactions, daily journals, and exit interviews representing interactions and conferences, information entered in daily journals, and answers to an exit interview.

Results

The learners experienced many successes involving: 1) instructional flexibility, 2) the use of structured instructional activities, and 3) an increased appreciation for the instructional design process. The most cited success was communicating with others at different times, and from different locations to accomplish the objectives of their assignments and small group activities. As the learners experience increased, so did their satisfaction with their assignments. However, learners working towards a Ph.D. degree found less structured activities to be as rewarding as compared to those that were highly structured. Where as, undergraduates and beginning M.A. degree learners reported success, but had much more difficulty on assignments that was very low at times, because computer usage and dialogues were sometimes new, and that their final grade depended on their ability to overcome their personal fears of computers, dialoguing, and the software.

Strengths. The learners measured their successes by comparing what they accomplished as compared to the accomplishments of other learners. In addition, all learners reported that the telephone was heavily depended on during the first weeks of the quarter to overcome computer and software difficulties.

Another success was the learner's expressed appreciation of the design process as the course progressed. Several comments suggest that the learner's appreciation of and value for well composed objectives increased as the course progressed.

A majority value cited in the daily journals was the speed and ease of doing small group work with out having to have a formal group meeting. During the exit interview, learners stated that this technology was 1) convenient to use, 2) not dependent upon someone else's schedule, and 3) an easy way to communicate with the instructor.

Problems and Concerns. The learners identified two major problems: 1) difficulties using "PARTICIPATE" and 2) an inadequate structure to facilitate overt participation.

The most documented problem was the learner's frustration with the computer conferencing software "Participate." They found the software's editor to be very limiting, slow, frustrating to use, and difficult to learn. Learner's with little computer experience did not complain in the beginning, however by the completion of the course everyone was very frustrated.

The learner's handled this problem by talking to each other by telephone between classes. As the learners gained self confidence, the number of daily computer dialogues increased.

Learners were very frustrated with their inability to easily save messages previously sent. This particular frustration encouraged the more advanced computer users to explore other software packages and computer services. This difficulty was finally resolved when learners moved to Mail Manager to send and save messages. At the completion of the quarter, the learners recommendation was to utilize Magnus' "Mail Manager" and "Talk" software rather than the "PARTICIPATE" software for future classes. The learners found these two software packages to be much more flexible, easy to learn and much easier to use.

Recommendations

All learners stressed the need for 1) a small class size, 2) required weekly check-ins, 3) highly structured activities, 4) access to a computer and MODEM at home or work, and 5) prior experience with computers and the software being utilized before taking this course. Learners who had their first experience with computers and PARTICIPATE during this course were more negative then were experienced computers users. Furthermore, the learners felt that three of ten class sessions which solely employed computer conferencing was appropriate for a beginning course. They felt that any more time spent would detract form the course and its worth-value.

Project Conclusions and Recommendations

Each pilot test program provided valuable recommendations for future programs utilizing computer conferencing or other forms of electronic communication. However, in the final analysis of the four pilot test programs, general conclusions and recommendations are offered regarding the use of computer conferencing and electronic communication in general for communicating between and among participants. The following conclusions and recommendations are provided:

1. The commercial electronic communication software "PARTICIPATE" was found to be frustrating by participants, thus it is recommended to explore other commercial and noncommercial software packages such as "Mail Manager", "Elm", "Newsgroup", "Talk", and "CompuServ" software for future instructional programs.

2. Ensure the availability of the appropriate hardware (computers and modems), software (communication package), and procedures for using computer conferencing or alternative electronic communication software. The lack of modems especially seem to be a limiting computer peripheral in using electronic communication.

3. The time utilized for introducing participants to computer conferencing or alternative forms of electronic communication should allow for ample practice time to ensure that the participants become comfortable in using the selected medium.

4. Program structure should facilitate access to the medium of electronic communication on a regular basis as part of the program. For instance, requiring weekly check-ins and developing highly structured activities.

5. Ensure continuing cooperation and support from the university computer system staff in developing an in-service program using computer conferencing or alternative forms of electronic communication.

6. The required reading placed on the instructor can become very demanding when large groups of participants are actively engaged in electronic communication, thus enrollment should be kept small, ranging from 9-12.

7. Prospective participants should be encourage to have prior experience with computers before attempting to engage electronic communication to minimize frustration.

8. Offer course utilizing computer conferencing or alternative forms of electronic communication for first time participants during the summer or winter.